

# Using Oxygen Analyzers As A Predictive Maintenance Tool For Air Heaters

The probe-type In Situ oxygen analyzer has become an indispensable tool for monitoring combustion process efficiency.

## New Application

A usual location for mounting an O<sub>2</sub> probe in boilers is downstream from the economizer. This location is ideal because it is close to the boiler, but the flue gas temperatures are usually below 1000°F (537°C). Some facilities mount one or more probes downstream from the “air heater”. The air heater exchanges the heat from the flue gas to the fresh air used to fire the burners. There is always a possibility that a leak can occur allowing fresh air to infiltrate into the flue gas and reducing the rate of heat transfer and diminishing boiler efficiency. Likewise, the leaked air is not available for combustion, reducing the maximum firing rate of the boiler.

This problem is particularly acute in the rotary regenerative designs, which must use a rotary seal to separate the hot flue gases from the fresh combustion air (see Figure 1). This type of air heater operates much like a revolving door. Plates in each section pick up heat from the hot flue gases, and, as the unit rotates, transfer this heat to the fresh air being preheated for combustion.

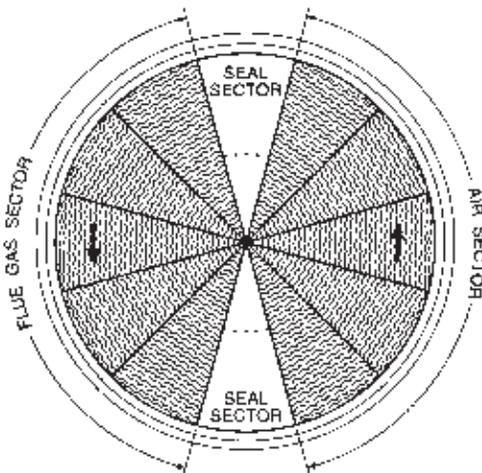


Figure 1. View from Inside the Duct

## The Solution

The Rosemount Analytical Model 6888 O<sub>2</sub> Analyzer mounted downstream from the air heater will tend to read higher than upstream analyzers, due to some air leakage past the seals. Over time, the downstream analyzer will read higher and higher, indicating greater seal wear. This indication of O<sub>2</sub> can be used to adjust heat rate calculations and can become a useful predictive maintenance tool for establishing a service interval for the air heater seals (see Figure 2).

For accurate, reliable O<sub>2</sub> analysis, Rosemount Analytical offers the Oxymitter™ In Situ Flue Gas Oxygen Transmitter and the X-STREAM In Situ Oxygen Transmitter. The user-friendly design of the Oxymitter™ In Situ Flue Gas Oxygen Transmitter and the X-STREAM In Situ Oxygen Transmitter probe allows convenient access to internal probe components for in-house service. In addition, Rosemount Analytical's patented electronic cell protection automatically protects the sensor cell's electrodes from harmful corrosive gases. And, the HART® Field Communications Protocol permits all operator functions to be performed from the control room.

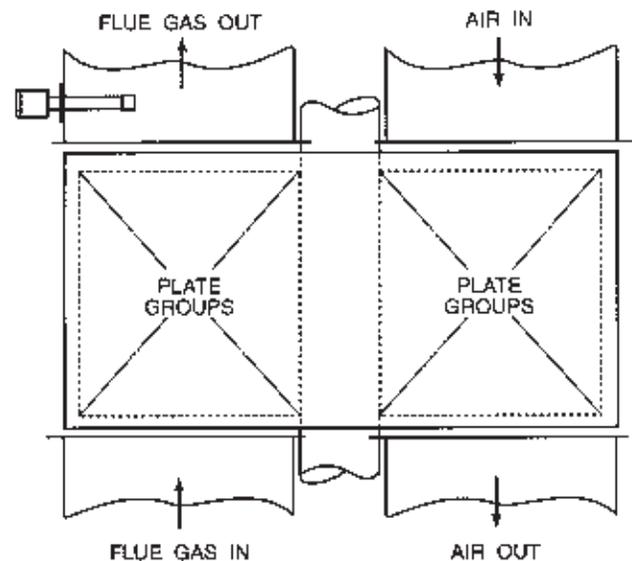


Figure 2. Side View

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